CLAIMS

1. A method for simulating film grain in an image block of M x N pixels, where N and M are integers greater than zero, comprising the steps of:

computing the average of the pixel values within the block of M x N pixels;

selecting a film grain block of M x N pixels from among a pool of previously established blocks containing film grain as a function of the average value of the image block and a random number; and

blending each pixel in the selected film grain block with a corresponding pixel in the image block.

2. The method according to claim 1 further including the step of accessing a look up table containing random numbers to obtain the random number.

3. The method according to claim 2 further comprising the step of populating the look-up table in advance of film grain simulation with random numbers generated by a random number generator.

4. A method for creating a block of M x N pixels with film grain, where N and M are integers greater than zero, comprising the steps of:

receiving film grain information that includes at least one parameter that specifies an attribute of the film grain to appear in the block;

creating a block of M x N random values selected from a previously established list of Gaussian random numbers;

computing an Discrete Cosine Transform of the M x N block of random numbers;

filtering the M x N coefficients resulting from the Discrete Cosine Transform by at least one parameter in the received film grain information;

computing an Inverse Discrete Cosine Transform of the filtered set of coefficients;

scaling all the pixel values in the block as indicated by one parameter in the received film grain information; and

storing the created block of film grain into a pool of film grain blocks.

5. The method according to claim 4 further comprising the step of performing an integer approximation of a Discrete Cosine Transform (DCT) and the Inverse Discrete Cosine Transform (IDCT) to reduce complexity.

6. The method according to claim 4 further comprising the step of scaling top and bottom edges of the created film grain block to hide block edges.

7. The method according to claim 4 wherein the step of receiving the film grain information further comprises the step of decoding a Supplemental Enhancement Information message containing the at least one parameter.

8. Apparatus for simulating film grain in an image block of M x N pixels, where N and M are integers greater than zero, comprising:

means for computing the average of the pixel values within the block of M x N pixels;

means for selecting a film grain block of M x N pixels from among a pool of previously established blocks containing film grain as a function of the average value of the image block and a random number; and

means for blending each pixel in the selected film grain block with a corresponding pixel in the image block.

9. The apparatus according to claim 8 further a look up table containing random numbers to obtain the random number.

10. The method according to claim 9 where the look-up table is populated in advance of film grain simulation with random numbers generated by a random number generator.

11. An apparatus for creating a block of M x N pixels with film grain, where N and M are integers greater than zero, comprising:

means for receiving film grain information that includes at least one parameter that specifies an attribute of the film grain to appear in the block;

means for creating a block of M x N random values selected from a previously established list of Gaussian random numbers;

means for computing an Discrete Cosine Transform of the M x N block of random numbers;

means for filtering the M x N coefficients resulting from the Discrete Cosine Transform by at least one parameter in the received film grain information;

means for computing an Inverse Discrete Cosine Transform of the filtered set of coefficients;

means for scaling all the pixel values in the block as indicated by one parameter in the received film grain information; and

means for storing the created block of film grain into a pool of film grain blocks.

12. The apparatus according to claim 11 further comprising means for performing an integer approximation of a Discrete Cosine Transform (DCT) and the Inverse Discrete Cosine Transform (IDCT) to reduce complexity.

13. The apparatus according to claim 11 further comprising the means for scaling top and bottom edges of the created film grain block to hide block edges.

14. The apparatus according to claim 11 wherein means for receiving the film grain information further comprises means for decoding a Supplemental Enhancement Information message containing the at least one parameter.